

WHAT IS CLAIMED IS:

1. A method for selectively separating at least one component from a multi-component fluidic sample, said method comprising:
 - 5 introducing said multi-component fluidic sample into a micro-fluidic device having a fluid flow path and at least one micro-valve comprising a phase reversible material; and
contacting said introduced multi-component fluidic sample with said microvalve under conditions sufficient for said at least one component to at least move
10 into said microvalve while the remaining components of said multi-component fluidic sample remain outside of said microvalve;
wherein said at least one component is selectively separated from said multi-component fluidic sample.
 - 15 2. The method according to Claim 1, wherein said phase reversible material is a phase reversible polymer.
 3. The method according to Claim 1, wherein said phase reversible material is thermo-reversible.
 - 20 4. The method according to Claim 1, wherein said method further comprises modulating the porosity of said microvalve at least once during said method.
 5. The method according to Claim 1, wherein said at least one analyte is a low
25 molecular weight analyte.
 6. A method for selectively separating components having a molecular weight below a threshold value from a multi-component fluidic sample, said method comprising:
 - 30 introducing said multi-component fluidic sample into a micro-fluidic device having a fluid flow path and at least one micro-valve comprising a phase reversible

material having a porosity that can be modulated in response to an applied stimulus;
and

contacting said introduced multi-component fluidic sample with said
microvalve under conditions sufficient for said components of said multi-component
5 fluidic sample having a molecular weight below said threshold value to at least move
into said microvalve while the remaining components of said multi-component fluidic
sample remain outside of said microvalve;

wherein said components having a molecular weight below a threshold value
are selectively separated from said multi-component fluidic sample.

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7. The method according to Claim 6, wherein said phase reversible material is a
phase reversible polymer.

8. The method according to Claim 6, wherein said phase reversible material is
15 thermo-reversible.

9. The method according to Claim 6, wherein said method further comprises
modulating the porosity of said microvalve at least once during said method by
applying said stimulus to said microvalve.

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10. The method according to Claim 9, wherein said stimulus is a change in
temperature.

11. The method according to Claim 6, wherein said threshold value is about 1000
25 daltons and said method is a method of desalting said multi-component fluidic sample.

12. A method for concentrating a multi-component fluidic sample with respect to
at least one constituent thereof, said method comprising:

introducing said multi-component fluidic sample into a micro-fluidic device
30 having a fluid flow path and at least one micro-valve comprising a phase reversible

material having a porosity that can be modulated in response to an applied stimulus;
and

- contacting said introduced multi-component fluidic sample with said
microvalve under conditions sufficient for components of said multi-component
5 fluidic sample having a molecular weight below a threshold value to at least move into
said microvalve while the remaining components of said complex fluidic sample
remain outside of said microvalve;

wherein said multi-component fluidic sample is concentrated with respect to at
least one constituent thereof.

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13. The method according to Claim 12, wherein said phase reversible material is a
phase reversible polymer.

14. The method according to Claim 12, wherein said phase reversible material is
15 thermo-reversible.

15. The method according to Claim 12, wherein said method further comprises
modulating the porosity of said microvalve at least once during said method by
applying said stimulus to said microvalve.

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16. The method according to Claim 15, wherein said stimulus is a change in
temperature.

17. A kit for use in selectively separating at least one component from a multi-
25 component fluidic sample, said kit comprising:

- (a) a micro-fluidic device having a fluid flow path and at least one micro-
valve comprising a phase reversible material; and
- (b) at least one of:
 - (i) instructions for practicing the method of Claim 1; and

